placed under the periosteum, that the space between the bone ends was bridged over. The wound was closed and a fixation dressing applied and primary union resulted. After three months there was a certain degree of but not absolute union. Vogel did not see the child again until the autumn of 1915. The previously treated tibia was then firmly united, but at the site of operation, it was bent into the varus position with massive bone thickening. On January 1, 1916, the curve of the tibia was again corrected, this time by a wedge-shaped osteotomy. The following conditions were found: At the highest point of the bone thickening, between the callus and the overlying periosteum, lay the two pieces of paraffin, unchanged since they were depositited there eight years before. They were entirely loose, not adherent to the periosteum or bone, and were readily pulled out by forceps. The paraffin, carefully dissolved, showed by the microscope, no foci of organization. It was exactly like a control piece of paraffin. Vogel says that the paraffin, by putting the periosteum under tension (as by the Bier subperiosteal blood injections) excited the periosteum to callus formation.

A Contribution to the Operative Treatment of Forearm Synostosis (Fracture-Callus).—Schlapfer (*Deutsch. Ztschr. f. Chir.*, 1916, cxxxii, 225) discusses the subject of synostosis between the radius and ulna, acquired and congenital, based upon the results of two operations on one case. The first operation, performed ten minutes after the accident, was unsuccessful, the callus bridge between the radius and ulna was chiselled through in its whole length, after which the supination of the forearm was complete, it having been fixed in pronation from the accident to the time of this operation. Nearly two years later there was no pronation of the forearm and the roentgen ray showed that the callus union of the two bones had reformed. A second operation was then done. With hammer and chisel the callus was so freely removed that the forms of the two bones were restored to the normal. The radius was then wrapped in a fat-fascia flap taken from the thigh, which was fixed in position by catgut sutures. The muscles were sutured by catgut, the subcutaneous tissue and skin also being sutured. After the operation, pronation and supination were rather free. Primary healing occurred. Passive movements were begun on the third day. When the patient was discharged, seventy-two days after operation, there was no active pronation or supination but, passively, these movements were possible to about 25 degrees. The roentgen ray showed normal configuration of both bones. A few bone splinters left in the soft tissues were in the process of absorption.

The Surgical Uses of Ozone.—Stoker (*Lancet*, October 21, 1916, p. 712) says that the first 21 cases treated by oxone at the Queen Alexandria Military Hospital cannot be regarded as anything but satisfactory from every standpoint, humanitarian, scientific, or economic. The cases were, for the most part, those of cavities and sinuses in the femur and tibia. It is the experience of those who have seen a great deal of war surgery that such cases obstinately resist treatment and are apt to remain unhealed for months and years. The treatment consists of the application of ozone to the affected parts; it is, therefore, necessary to have an apparatus for generating ozone which shall be portable and easily worked. Stoker uses the Andriolis ozonizer. It is called into operation by a four volt battery animating a ¼-inch sparking Rhumkorff coil. The oxygen passes from a cylinder through the ozoniser, and in doing so comes in contact with a metal armature, the effect of this being to transform the oxygen into ozone. A tabulated statement showing the effects of the treatment in 21 cases with chronic bone sinuses is very favorable to this method. The properties of ozone are, are far as one can say at present, three: It is a strong stimulant and determines an increased flow of blood to the affected part. It is a germicide, which destroys all hostile microörganic growth. As the French chemist, Hennocque, has shown, it has great powers in the formation of oxyhemoglobin. The ozone is applied on the wounded surface or to the cavities and sinuses for a maximum time of fifteen minutes, or until the surface becomes glazed. Ozone has the particular power of disclosing dead bone, foreign bodies, septic deposits, etc. Stoker believes it does this by destroying the granulations and microorganic growths (presumably unhealthy) that are found in close contact with septic deposits, foreign bodies, or dead bone. Wounds and sinuses, etc., are washed twice daily with boiled water and a dressing of dry gauze is applied. It must be observed that at first ozone causes an increase of the discharge of pus; later on the pus is replaced by clear serum, which at a still later stage becomes colored reddish or pinkish. In open wounds it is necessary to strip off the parchment-like film surrounding the edges, which is composed of oxydized serum. This is easily effected by applying a hot compress for fifteen or twenty minutes, after which the film can be easily peeled off with a dissecting forceps.

THERAPEUTICS

UNDER THE CHARGE OF

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Autogenous Defibrinated Blood in the Treatment of Bronchial Asthma.—KUHN and EMSHEIMER (*Arch. Int. Med.*, 1916, xviii, 445) say that inasmuch as bronchial asthma is due to sensitization by a foreign protein, immunization by injection of the causal protein should be of benefit. They believe that with each attack of asthma there occurs a sudden or gradual liberation into the circulating blood of the protein which excites the attack. If blood is withdrawn during the attack it presumably contains the toxic protein or antigen. Repeated injections of this defribrinated blood are made subcutaneously at varying intervals. The quantities of antigen contained in each injection are so minute as to create a very small amount of antibody each time,